Examining Small-scale Geographic Estimates from the American Community Survey 5-year Data

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Question:

- How good (or bad) are small-scale ACS data?

- Uses 5-year data file (2005-2009)

Secondary Question:

How difficult (or easy) will it be to use the ACS data to actually answer research questions?

Approach

1. Identify a typical analytic “problem” that an applied researcher might encounter – and then try to answer it

2. Evaluate this process and the results

Evaluation

How do we determine quality of estimates?

1. Statistical – Coefficients of variation

CV= (SE/Estimate)

2. Substantive – Difficult to quantify; visual examination (maps) of a collection of estimates

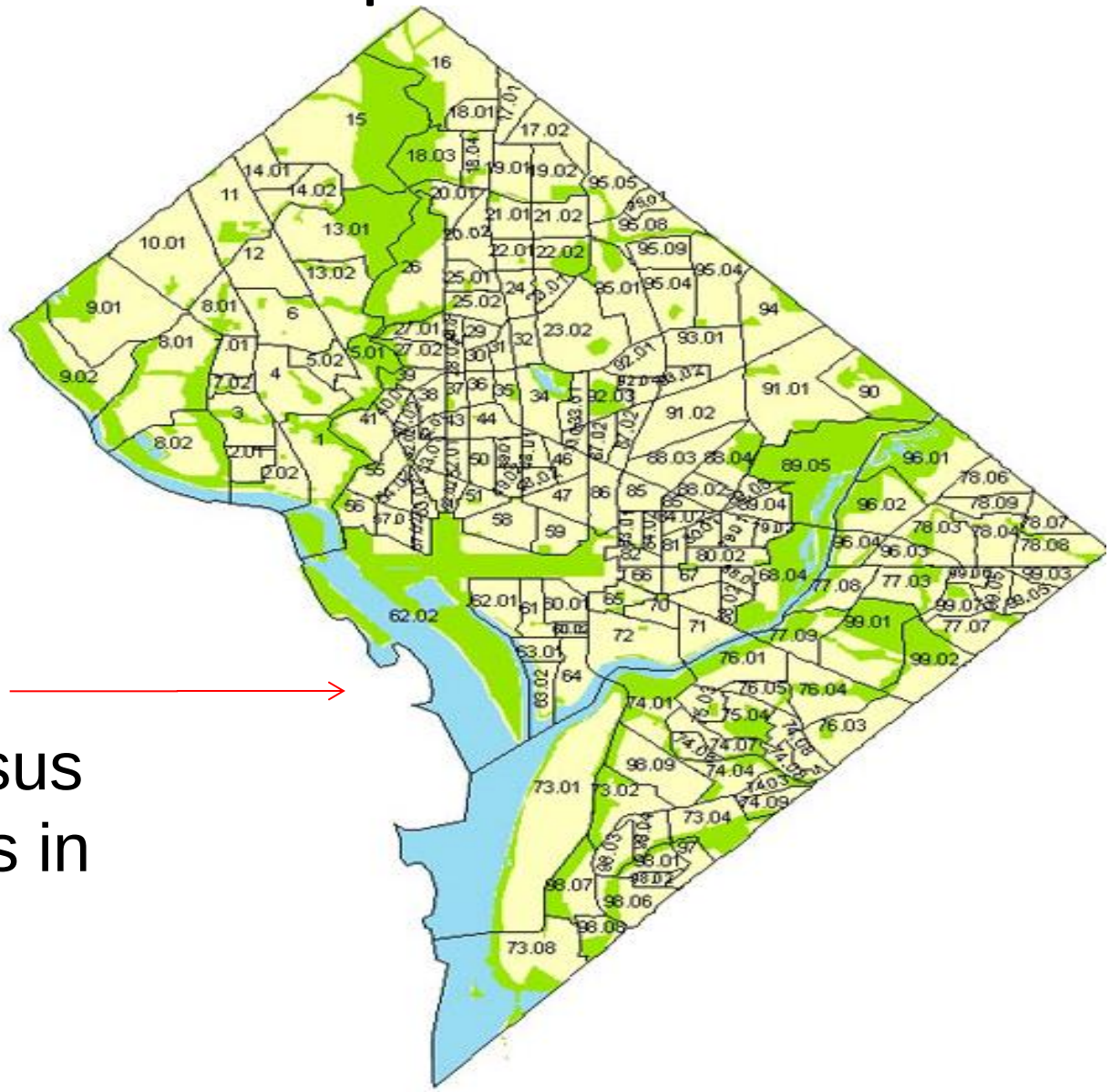
Important to pay attention to BOTH methods of evaluation

Problem

<u>High school dropouts in Washington, D.C.</u>

- How bad is the problem?
- Is the problem geographically focused?
- Can ACS data differentiate areas of the city?

Figure 1: D.C. Tract Map with Tract Identification Numbers



188 Census tracts in D.C.

Reminder

- Important to evaluate from the perspective of a researcher NOT employed by the Census Bureau

- Must use publicly available data

- Major focus on ease of use – we want to minimize any additional computations ("The mayor needs it NOW!")

Data

- PUMS option provides lots of analytical control, but not good for small geographies (PUMA=100k)

- Focus instead on ACS “pre-tabulated” data

  - Tables in either AFF or data download
  - Data provided down to tract/block group

Figure 2: Example of Table B14005 for D.C. Tract 1

- Table provides estimate of 16-19 year olds, not enrolled and not HS grads, by gender

	Estimate	Margin of Error
Total:	422	+/-222
Male:	214	+/-204
Enrolled in school:	162	+/-121
Employed	33	+/-31
Unemployed	39	+/-65
Not in labor force	90	+/-51
Not enrolled in school:	52	+/-87
High school graduate:	0	+/-132
Employed	0	+/-132
Unemployed	0	+/-132
Not in labor force	0	+/-132
Not high school graduate:	52	+/-87
Employed	13	+/-22
Unemployed	13	+/-22
Not in labor force	26	+/-43
Female:	208	+/-88
Enrolled in school:	175	+/-74
Employed	14	+/-23
Unemployed	23	+/-26
Not in labor force	138	+/-63
Not enrolled in school:	33	+/-45
High school graduate:	28	+/-42
Employed	28	+/-42
Unemployed	0	+/-132
Not in labor force	0	+/-132
Not high school graduate:	5	+/-12
Employed	5	+/-12
Unemployed	0	+/-132
Not in labor force	0	+/-132

Source: U.S. Census Bureau, 2005-2009 American Community Survey

User must combine estimates and convert to a percentage, then re-compute standard error as a percentage

Several Analytic Possibilities:

- Persons 18-24 without a HS degree
- Persons 25+ with a HS degree
- Persons 18-24 with a HS degree
- Census 2000: Persons 25+ with a HS degree

Figure 3: Example of Table B15001 for D.C. Tract 1

- Table provides estimate of 18-24 year olds, not HS grads, by gender

	Census Tract 21.01, District of Columbia, District of Columbia	
	Estimate	Margin of Error
Total:	3,964	+/-412
Male:	1,767	+/-305
18 to 24 years:	192	+/-137
Less than 9th grade	13	+/-22
9th to 12th grade, no diploma	26	+/-43
High school graduate, GED, or alternative	76	+/-62
Some college, no degree	77	+/-79
Associate's degree	0	+/-132
Bachelor's degree	0	+/-132
Graduate or professional degree	0	+/-132
25 to 34 years:	441	+/-135
Less than 9th grade	49	+/-39
9th to 12th grade, no diploma	72	+/-61
High school graduate, GED, or alternative	84	+/-79
Some college, no degree	60	+/-51
Associate's degree	38	+/-44
Bachelor's degree	76	+/-60
Graduate or professional degree	62	+/-61
35 to 44 years:	426	+/-140
Less than 9th grade	85	+/-74
9th to 12th grade, no diploma	66	+/-64
High school graduate, GED, or alternative	80	+/-60
Some college, no degree	19	+/-26
Associate's degree	58	+/-65
Bachelor's degree	27	+/-34
Graduate or professional degree	91	+/-98
45 to 64 years:	509	+/-147
Less than 9th grade	120	+/-116
9th to 12th grade, no diploma	25	+/-24
High school graduate, GED, or alternative	185	+/-80
Some college, no degree	69	+/-47
Associate's degree	51	+/-44
Bachelor's degree	23	+/-25
Graduate or professional degree	36	+/-44
65 years and over:	199	+/-72
Less than 9th grade	45	+/-39
9th to 12th grade, no diploma	36	+/-34
High school graduate, GED, or alternative	80	+/-48
Some college, no degree	38	+/-39
Associate's degree	0	+/-132
Bachelor's degree	0	+/-132
Graduate or professional degree	0	+/-132
Female:	2,197	+/-284
18 to 24 years:	353	+/-130
Less than 9th grade	11	+/-17
9th to 12th grade, no diploma	99	+/-55
High school graduate, GED, or alternative	135	+/-84

User must combine estimates and convert to a percentage, then re-compute standard error as a percentage

Figure 4: Example of Table S1501 for D.C. Tract 1

- Table provides percentage estimate of 18-24 year olds, not HS grads & percentage estimate of 25+ year olds, HS grads

Direct estimates. No computations required!

- Subject Definitions
- Quality Measures

Subject	Total	Margin of Error	Male	Margin of Error	Female	Margin of Error
Population 18 to 24 years	**545**	**+/-201**	**192**	**+/-137**	**353**	**+/-130**
Less than high school graduate	27.3%	+/-14.4	20.3%	+/-27.4	31.2%	+/-15.9
High school graduate (includes equivalency)	38.7%	+/-16.4	39.6%	+/-28.4	38.2%	+/-18.5
Some college or associate's degree	27.3%	+/-18.2	40.1%	+/-26.0	20.4%	+/-18.5
Bachelor's degree or higher	6.6%	+/-7.6	0.0%	+/-18.7	10.2%	+/-11.2
Population 25 years and over	**3,419**	**+/-326**	**1,575**	**+/-254**	**1,844**	**+/-219**
Less than 9th grade	14.6%	+/-5.5	19.0%	+/-10.4	10.9%	+/-3.8
9th to 12th grade, no diploma	11.9%	+/-4.2	12.6%	+/-5.7	11.3%	+/-5.6
High school graduate (includes equivalency)	29.9%	+/-5.9	27.2%	+/-7.4	32.1%	+/-7.8
Some college, no degree	16.3%	+/-4.0	11.8%	+/-5.4	20.2%	+/-6.1
Associate's degree	7.8%	+/-3.7	9.3%	+/-6.0	6.4%	+/-3.5
Bachelor's degree	10.5%	+/-3.8	8.0%	+/-5.3	12.6%	+/-4.7
Graduate or professional degree	9.0%	+/-4.8	12.0%	+/-9.6	6.5%	+/-4.1
Percent high school graduate or higher	73.5%	+/-6.3	68.4%	+/-11.1	77.8%	+/-6.5
Percent bachelor's degree or higher	19.5%	+/-5.2	20.0%	+/-8.6	19.1%	+/-5.6

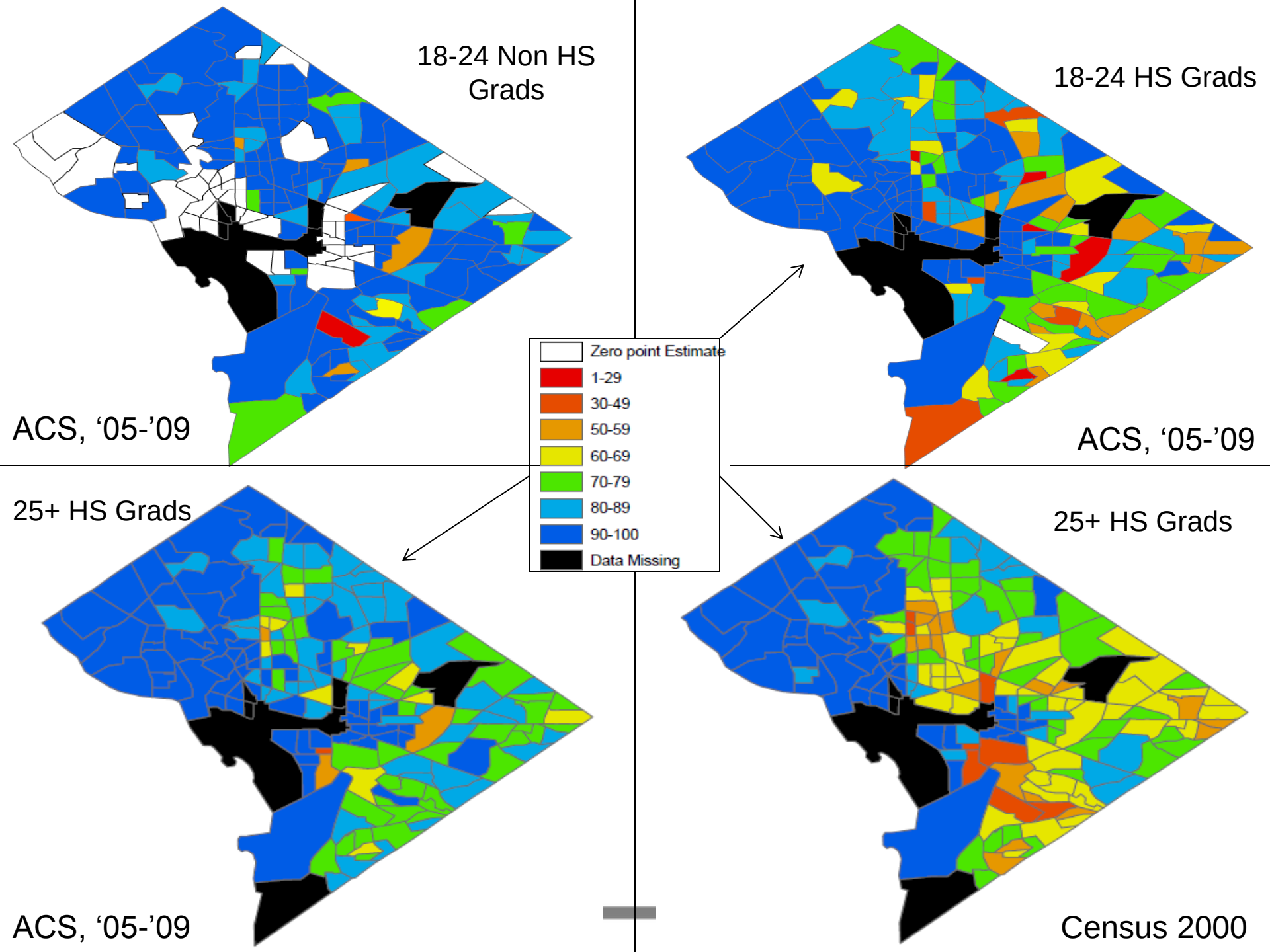
Three Things to Examine:

- The estimates themselves

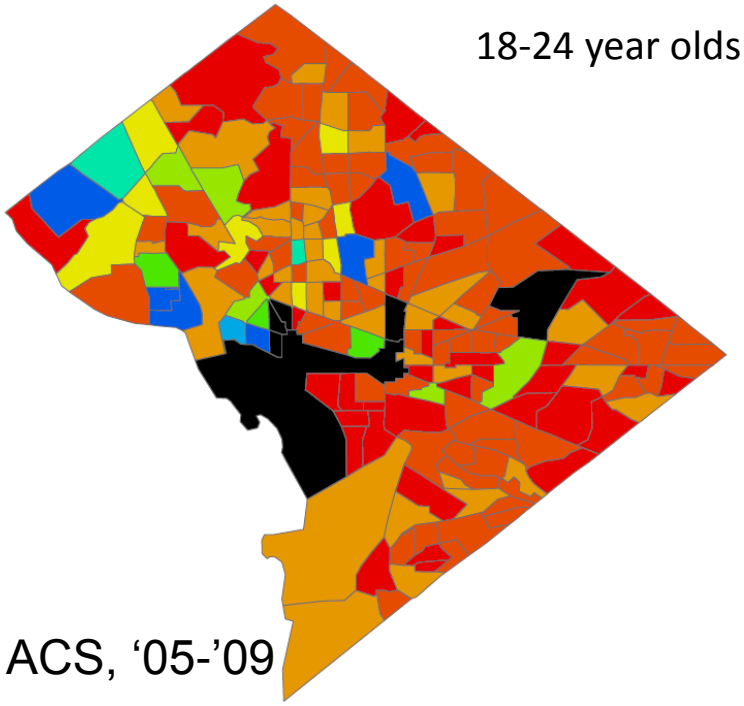
- Number of sample cases (NOT publicly available

- Coefficients of variation
  (CV = SE/EST)

Estimates of High School Completion (or not)

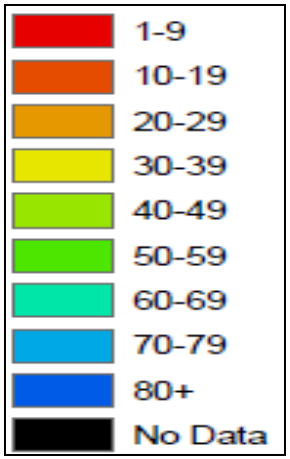

18-24 Non HS Grads
ACS, '05-'09
18-24 HS Grads
ACS, '05-'09
Zero point Estimate
1-29
30-49
50-59
60-69
70-79
80-89
90-100
Data Missing
25+ HS Grads
ACS, '05-'09
25+ HS Grads
Census 2000

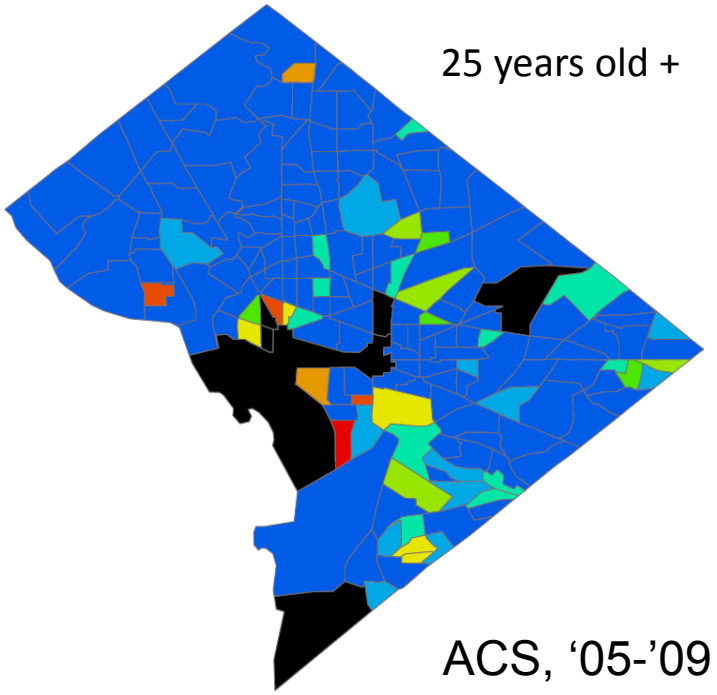
Sample Data Counts



18-24 year olds

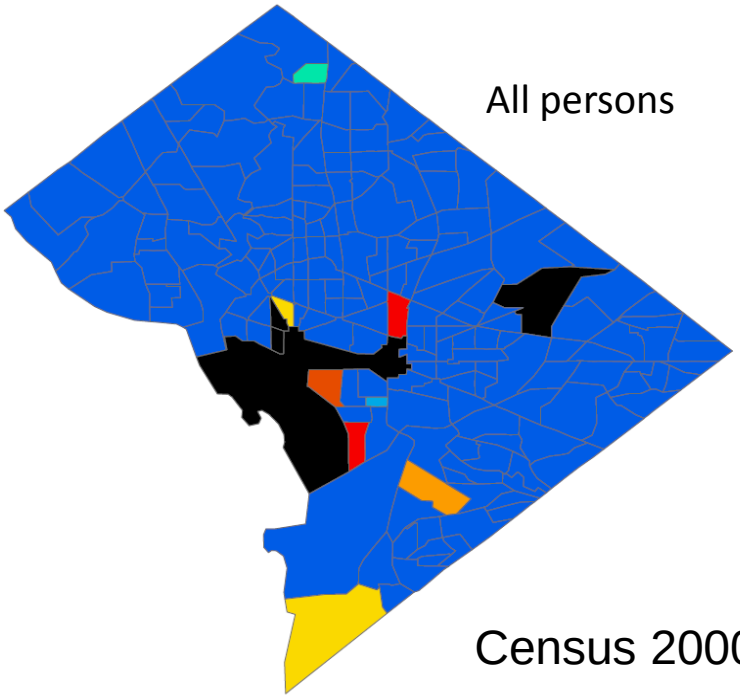
ACS, ‘05-’09





25 years old +

ACS, ‘05-’09

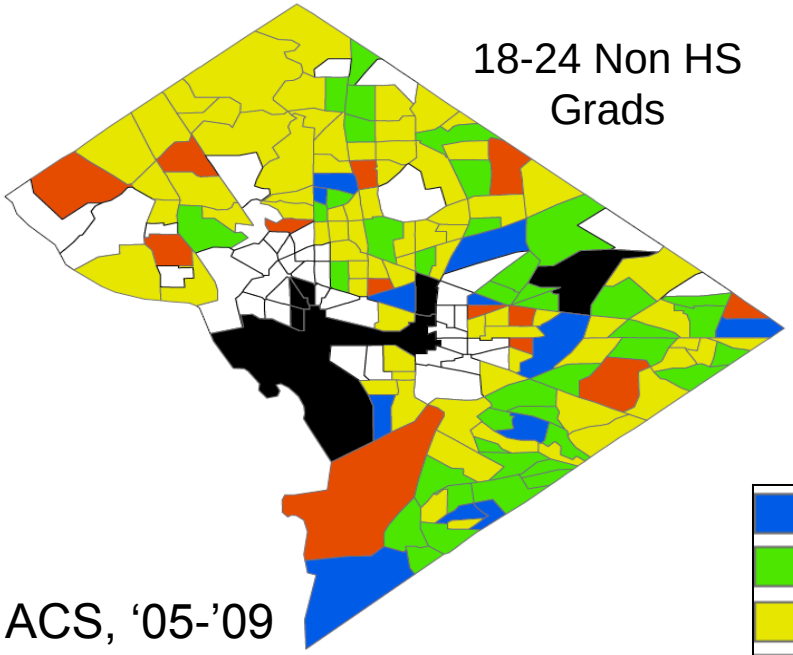


All persons

Census 2000

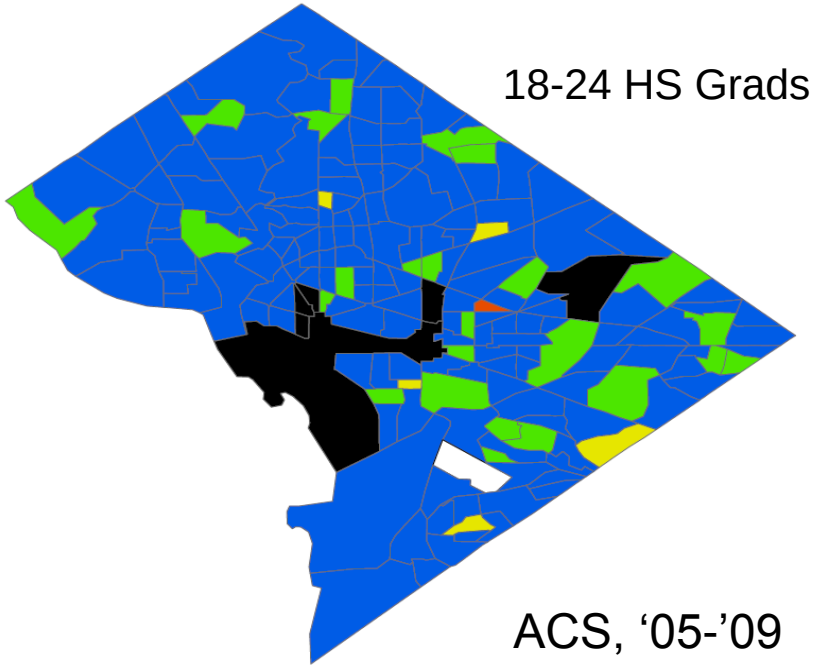
Coefficients of Variation

18-24 Non HS Grads



ACS, ‘05-’09

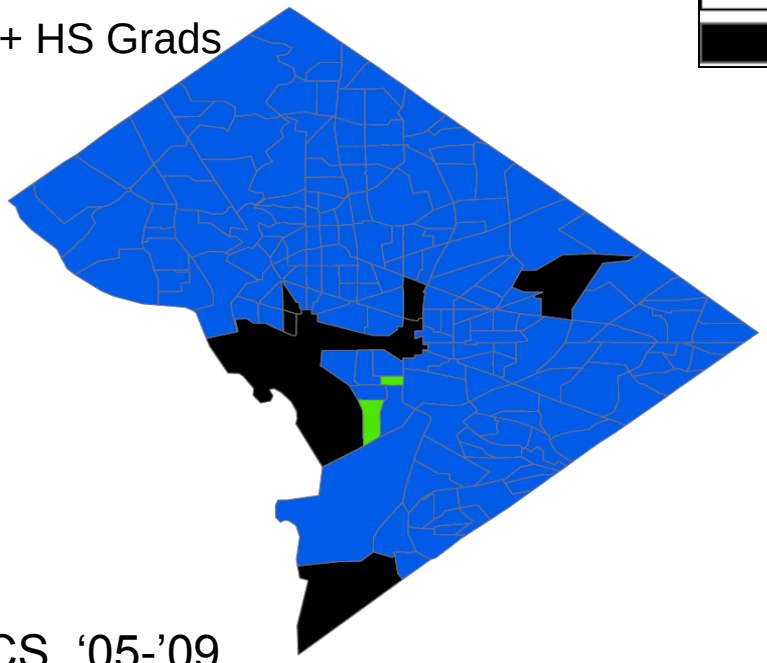
18-24 HS Grads



ACS, ‘05-’09

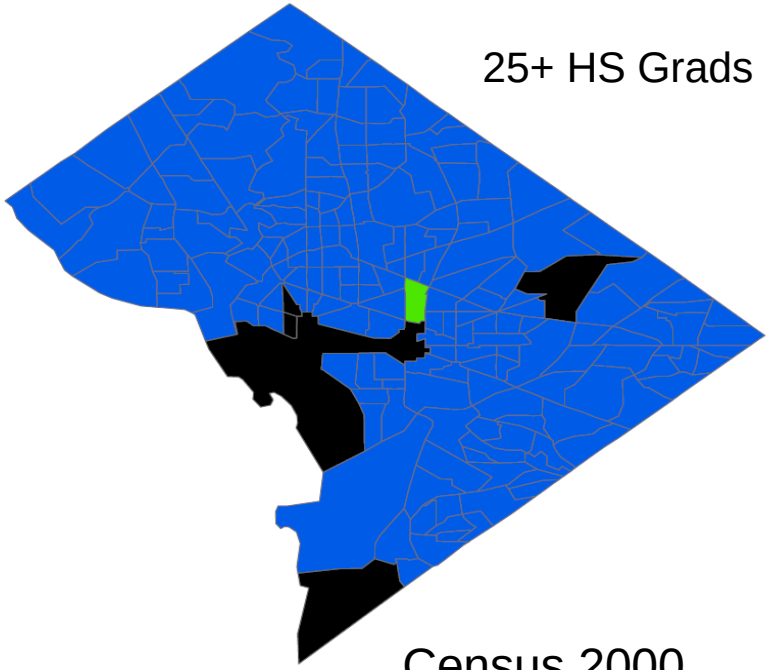
0-.24
.25-.49
.5-.99
1.0-1.49
Zero point estimates
Data missing

25+ HS Grads



ACS, ‘05-’09

25+ HS Grads



Census 2000

- Smaller samples yield fewer cases of analytic interest

- Changing the sample increased the analytic sample (the numerator)

-Changing the universe also increased the analytic sample

-CV’s fall whenever S.E. drops or the estimate increases

How well do our measures correlate with one another?

- Measure 1 -- 2005-9 ACS Dropout level, ages 18-24
- Measure 2 -- 2005-9 ACS High school completion, ages 25+
- Measure 3 -- Census 2000 High school completion, ages 25+
- Measure 4 – 2005-9 ACS High school completion, ages 18-24

	M1	M2	M3	M4
M1	*	-.520	-.525	-1.00
M2		*	.826	.520
M3			*	.525
M4				*

Conclusions

- Small-scale geographic ACS data appear to be fairly robust
- Users will need to spend time thinking of the best way to approach their problem, but if they can find data that fit, small area geographic questions can be addressed
- Substantively, data are NOT misleading, particularly when considered in the proper context

Contact Information

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